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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,970	03/26/2004	Mong-Song Liang	24061.197 (2003-1506)	9657
42717	7590	09/12/2005	EXAMINER	
HAYNES AND BOONE, LLP 901 MAIN STREET, SUITE 3100 DALLAS, TX 75202			DANG, PHUC T	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/810,970

Applicant(s)

LIANG ET AL.

Examiner

PHUC T. DANG

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed July 11, 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 49-67 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 61-63 and 66 is/are allowed.
- 6) ☒ Claim(s) 49, 52, 55, 58, 64, 65 and 67 is/are rejected.
- 7) ☒ Claim(s) 50, 51, 53, 54, 56, 57, 59 and 60 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 2818

DETAILED ACTION

Response to Arguments

1. Applicant's argument filed on July 11, 2005 with respect to claims 49-67 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 49, 52, 64 and 67 are rejected under 35 U.S.C. 102 (b) as being anticipated by Matsuda et al., hereinafter "Matsuda" (U.S. Patent No. 6,333,215).

Regarding claim 49, Matsuda discloses a method of manufacturing a semiconductor device comprising:

providing a low dielectric material (12, Fig. 1 and col. 6, line 1-5);

applying a first treatment altering a first property of the low dielectric material, the first treatment being a treatment other than a thermal treatment (chemical treatment) (col. 3, lines 11-17); and

Art Unit: 2818

applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability (col. 3, lines 42-48).

The first treatment is performed at a temperature higher than the temperature in the second treatment as disclosed in Matsuda's reference (see col. 3, lines 49-53), which will produce a lower dielectric material 12 with better mechanical stability (see col. 3, lines 18-21).

Claim 52 is rejected similar to claim 49 above including the second treatment being a treatment other than a thermal treatment (see col. 3, lines 11-17).

Claims 64 and 67 are rejected similar to claim 49 above including wherein one of the first and second treatment comprises treating the low dielectric material with a plasma (see col. 1, lines 54-56).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda in view of Nagahara (U.S. Publication No. US 2005/0124168 A1).

Matsuda discloses all the features of the claimed invention as discussed above, but does not disclose the first treatment treating the low dielectric material with ultraviolet radiation.

Art Unit: 2818

Nagahara, however, discloses the first treatment treating the low dielectric material with ultraviolet radiation [see paragraph 0022].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to modify the above discussed teaching of Matsuda as taught by Nagahara for a purpose of improving a process.

4. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda in view of Chen et al., hereinafter "Chen" (U.S. Patent No. 6,861,339 B2).

Matsuda discloses all the features of the claimed invention as discussed above, but does not disclose the first treatment treating the low dielectric material with hydrogen-based plasma.

Chen, however, discloses the first treatment treating the low dielectric material with hydrogen-based plasma [col. 4, lines 45-55].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to modify the above discussed teaching of Matsuda as taught by Chen for a purpose of improving a process.

5. Claim 65 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda in view of Ghio et al., hereinafter "Ghio" (U.S. Patent No. 6,051,443).

Matsuda discloses all the features of the claimed invention as discussed above, but does not disclose one of the first and second treatment comprises treating the low dielectric material with ultraviolet radiation.

Ghio, however, discloses one of the first and second treatment comprises treating the low dielectric material with ultraviolet radiation [col. 6, lines 48-51].

Art Unit: 2818

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to modify the above discussed teaching of Matsuda as taught by Ghio for a purpose of improving a process.

Allowable Subject Matter

6. Claims 61-63 and 66 would be allowed.

The following is a statement of reason for the indication of allowable subject matter:

Claims 61-63 and 66 are considered allowable since the prior art of record and the considered pertinent to the applicant's disclosure does not teach or suggest the claimed invention having a step of applying the first treatment the low dielectric material with microwave hydrogen plasma as cited in claim 61 and one of the first and second treatment comprises treating the low dielectric material with electron beam as cited in claim 66.

Claims 50-51, 53-54, 56-57, and 59-60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claim.

None of the prior art made of record does not disclose wherein applying a first treatment comprises subjecting the low dielectric material to a treatment selected from a group consisting of hydrogen-based plasma, electron beam, ultraviolet radiation, and microwave hydrogen plasma as cited in claims 50 and 53 and wherein applying a second treatment comprises subjecting the low dielectric material after the first treatment to a treatment selected from a group consisting of hydrogen-based plasma, electron beam, ultraviolet radiation, and carbon-based plasma, microwave hydrogen plasma as cited in claims 51 and 54 and the second treatment comprises

Art Unit: 2818

treating the low dielectric material with microwave hydrogen plasma as cited in claim 56 and the second treatment comprises treating the low dielectric material with ultraviolet radiation as cited in claim 57 and the second treatment comprises treating the low dielectric material with carbon-based plasma as cited in claims 59 and 62 and the second treatment comprises treating the low dielectric material with hydrogen plasma as cited in claims 60 and 63.

Conclusion

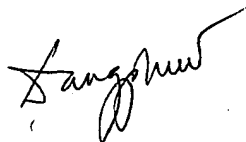
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is (571) 272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.

8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications 9. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Phuc T. Dang

Primary Examiner

Art Unit 2818

A handwritten signature in black ink, appearing to read 'Phuc T. Dang', is written over the printed name and title.